

and "hop extract," it is believed to be clear that the hops has not previously been extracted. Otherwise, it would fall within the "hop extract."

Claims 1, 2, 7-12 and 19-28 have been rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. According to the Examiner, the scope of the phrase "essential oil components" is unknown. This rejection is believed to be moot in view of the instant amendment.

Claims 1 and 2 have been amended to delete "components." The claims thus now recite that the ratio of "essential oil" to α -acids is increased by at least 2. One skilled in the art would recognize what "essential oils" are. As stated in the specification, the essential oil is the component of hops which provide its aroma. *See, e.g.*, page 2, lines 3-7. The specification further teaches how to measure the essential oil in the hops at page 15, lines 32-35. That the term "essential oils" is well recognized in the art is also evident by reference to The Encyclopedia of Beer, cited in the Official Action (*see, e.g.*, page 251). It is noted that the term "essential oil" itself has not been objected to, but only "essential oil components" as previously recited in claims 1 and 2. This amendment is thus believed to overcome the rejection. Withdrawal of this rejection is respectfully requested and believed to be in order.

Claim 2 has been rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Haeffner et al, U.S. Patent No. 5,011,594. This rejection is respectfully traversed.

Haeffner et al fails to anticipate, or even render obvious, applicants' claimed invention. This reference neither discloses nor suggests the specific extraction conditions recited in applicants' claims. The prior Official Action asserted that Example 3 teaches the treatment of hops with supercritical carbon dioxide. As argued in applicants' prior response,

this assertion is in error. In Example 3, the "hop extract starting material" is treated with supercritical carbon dioxide. The hop extract starting material is prepared by extracting hops with ethanol. This does not teach the treatment of hops *per se* with supercritical carbon dioxide.

The Examiner asserts that the definition of "hops" in the specification is ambiguous and that, when broadly interpreted, includes "flowers, plugs, pellets and hop extracts." This interpretation is in error. The claim terms should be read in light of the specification and the specification does not define "hops" as broadly as alleged.

For example, at page 1, line 28 to page 2, line 2, the specification defines "hops" as being "whole hops which have been dried after harvesting, or further processed hop flour, hop pellets." The dried hops are then said to be undesirable for use in beer due to ready deterioration by oxidation to give deteriorated odor and rough taste. In view of the disadvantages of dried hops, the specification states that hops extract is used. Page 2, lines 1-2.

The instant specification thus distinguishes between "hops" and "hops extract." The distinction between the two is further seen at page 3 of the specification. Moreover, the claims themselves show the distinction between "hops" and "hops extract." The claims are directed to creating a "hops extract" starting with "hops." The claims thus show that the broadest reasonable interpretation of "hops" does not include "hops extract." To make this distinction even more clear, however, the claims have been amended to recite that the hops have not previously been extracted.

Haeffner et al thus fails to teach the treatment of hops with supercritical carbon

dioxide as instantly claimed. Nor would it have been obvious that the hops should be treated with supercritical carbon dioxide as instantly claimed. Since the reference fails to teach the treatment of hops *per se*, it fails to teach a process wherein an essential oil-rich hop extract will be produced as instantly claimed.

In response to applicants' position that Haeffner fails to teach that the hops should be extracted at one specific temperature and then the separation steps should be performed at different temperatures, as claimed by applicants, the official Action states that claim 2 does not specify temperature. However, since supercritical or subcritical conditions are defined by a *combination* of pressure *and* temperature, and since pressure is defined, the allowable range of temperature is also necessarily defined. Further definition of temperature is unnecessary.

In view of the above, withdrawal of this rejection is respectfully requested and believed to be in order.

Claim 1 has been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Haeffner et al. This rejection is respectfully traversed.

As stated *supra*, in Haeffner et al "hop extract starting material", not hops *per se*, is treated with supercritical carbon dioxide. This treatment of hop extract starting material would in no way suggest that hops should be treated with supercritical carbon dioxide solvent, as recited in claim 1, to produce an essential oil-rich hop extract having the ratio of essential oil components as claimed. Haeffner fails to disclose and in no way even suggests treatment of hops to produce an "essential oil-rich hop extract" wherein the ratio of essential oil to α -acid (g) in the extracted hops is increased by at least 2. Instead, as described in the Summary of the Invention, the goal of Haeffner is to "provide a greater yield

of extracted product mixtures of organic substances and easy discharge of the extraction residue." Haeffner is thus unrelated to a method as recited in claim 1.

Withdrawal of this rejection is respectfully requested and believed to be in order.

Claims 1, 2 and 7-28 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over ANH (BE Pat. No. 1897012) in view of Krasd Food (U.S. Patent No. 1,601,112). This rejection is respectfully traversed.

ANH allegedly teaches a process for the use of spent hops to produce a wort and subsequent beer. Krasd Food allegedly discloses using the waste from a CO₂ extraction process along with the CO₂ extract in the production of wort. The Official Action asserts that it would have been obvious to use a CO₂ extract as in Krasd Food in the process of ANH as CO₂ extracts are well known and used.

Contrary to the Official Action, ANH and Krasd Food are unrelated to the instantly claimed invention. ANH describes the combined use of hop resin and dried and powdered hop residue. Hop resin is different from essential oil in hops. The hop resin is used in the ANH reference to add a bitter taste to beer. By contrast, according to applicants' invention, the bitter taste will be decreased and the aroma will be improved. The α -acids give beer the bitter taste, while essential oils impart the aroma of beer. *See*, page 2, lines 6-7 of the specification. By teaching how to add a bitter taste to beer, ANH is unrelated to the instant claims directed to increasing the ratio of essential oils to α -acids in hops extract, and the use of such extract. ANH thus fails to disclose a "process for production of an essential oil-rich hop extract," as instantly claimed. Nor does it describe processes which employ such essential oil-rich hop extracts.

Krasd Food fails to overcome or remedy this deficiency in ANH. Krasd Food relates to the addition of a hop extract, etc., to wort. Krasd Food is also unrelated to the production of an essential oil-rich hop extract and fails to overcome or remedy this deficiency in ANH.

Neither of the cited references, alone or in combination, discloses or even suggests a process for production of an essential oil-rich hop extract, wherein the hops is extracted with supercritical or subcritical carbon dioxide solvent. Both of the cited references relate to "waste spent hops" and fail to disclose extraction of hops *per se*, which is what is recited in the process of applicants' claims.

Nor does either of the references disclose or even suggest a process wherein hops is extracted with supercritical or subcritical carbon dioxide solvent or the use of specific extraction and separation pressures in a process for producing a hop extract having an increased ratio of essential oil to α -acids as instantly claimed. There is no recognition in either reference that by extracting hops with supercritical or subcritical carbon dioxide solvent at the claimed pressure and then separating the hop extract from the carbon dioxide extract an increased ratio of essential oil to α -acids could be obtained. Nor does the cited art teach the use of a hop extract produced by such a process.

In view of the above, withdrawal of the rejection of the claims under §103(a) is respectfully requested. Such action is believed to be in order.

In view of the above, further and favorable action in the form of a Notice of Allowance is respectfully requested. Such action is believed to be in order.

In the event that there are any questions relating to this amendment, or to the application in general, it would be appreciated if the Examiner would telephone the


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Respectfully submitted,

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